Abstract

Due to the prevalence and seriously negative consequences associated with mental illness stigma, a number of interventions have been developed to ameliorate the situation. Theatric performance and contact-based approaches represent promising modes of stigma-reduction intervention. One potential intervention that combines the contact and the artistic aspect is administering videos of people narrating about their experience of stigma, but no empirical evaluations have been published. This study examined the efficacy of a video of an individual diagnosed with bipolar disorder describing some general stereotypes and daily labeling experiences. Participants (*N*=38) were students from the USA, Taiwan, and India recruited by snowball sampling. They completed a pretest with a stigma and depression measure, along with questions about demographics and their GPA, then were randomly assigned to one of two video conditions: (1) the intervention video described above, or (2) an informational video with some facts about mood disorder. All then completed a depression and stigma measure post-test. Self-stigma scores increased in both conditions. Academic ability did not moderate the relationship between pretest and posttest scores in both conditions, although academic ability itself and the pretest stigma scores correlated positively and significantly with posttest scores. Brief video exposure requires additional careful evaluation of its efficacy before implementing widely.

The Relationship Between Self-Stigma, Depression, and Academic Achievement Among College Students

Stigmatization, composed of wrongful stereotypes, prejudice and discrimination, is a detrimental factor impacting the well-being of many mentally ill patients (Corrigan & Watson, 2002). Stigma is especially prevalent in cultures that have misunderstandings about mental illness. Patients in these cultures, influenced by the general public's negative feelings, become highly susceptible to negative stigma, and eventually become discouraged from pursuing the kinds of opportunities that would define a quality life (Corrigan, Larson, & Rüsch, 2009).

Stigma about mental illness seems to be widely endorsed in two forms: (1) public stigma, the negative belief, emotional reaction and behaviors about a group; (2) self-stigma, the negative perceptions and behaviors towards oneself (Corrigan & Watson, 2002). Although a large body of literature has accrued with respect to the impact of public stigma on people with mental disorders (Parcesepe & Cabassa, 2013), the literature on the specific relationship between self-stigma and the severity of mental illness is comparatively lean. Thus, reducing self-stigma among mentally ill population has become a fundamentally crucial problem that needs deliberate consideration when designing treatments for mental disorders.

Stigma pervades multiple aspects of the lives of people affected by mental illness. From a treatment perspective, people with higher self-stigma are less inclined to seek professional help and less likely to adhere to treatment when they do reach out (Fung, Tsang, & Corrigan, 2008). From a social perspective, people who internalize stereotypes about mental illness also experience low self-esteem and self-efficacy (Corrigan & Larson, 2009), which discourages them from pursuing their goals and even engaging in normal social interactions.

The Pleasure-Arousal-Dominance (PAD) model developed by Mehrabian and Russell (1996) suggests a mechanism for how the negative self-perception and frustration experienced by socially stigmatized patients can lead to increased depression. The symptoms and disabilities as a result of their mental conditions often times lead to the failure to attain social goals, which in turn decreases subjects' perceived control of their lives and leads to an increase in their experience of low-dominance emotions, such as depression. Consequently, more intense depressive symptoms generate more negative self-stigma, perpetuating a vicious cycle.

Undesirable achievement events trigger the pessimistic global attribution style of people with mental disorder, which in turn causes more severe depressive symptoms (Abramson, Metalsky, & Alloy, 1989). The social repercussions of low grades also are consistent with the Pleasure-arousal-dominance model predicting that lower sense of control (lower dominance) would increase depressive symptoms (see also Plutchik, 1994). Conversely, higher academic performance shows a positive correlation with self-esteem (Booth & Gerard, 2011) across different cultures, suggesting that it may buffer against depression. One particular study compared self-evaluation responses collected from Chinese students raised in Britain and in Hong Kong. Results showed that both cultures talk similarly as they used academic achievement as a part of their self-appraisal with a positive tone (Chan, 2000).

Some people internalize the stigmatized stereotypes around them and suffer diminished self-esteem and damaged self-efficacy. Others seem to be motivated by the same stigmatized message and become empowered to fight against them. The latter group was found to be more confident about the pursuit of individual goals and more active in seeking treatments, even crafting interventions tailored to their strengths, weaknesses and needs. Personal empowerment serves as a mediator between self-stigma and behaviors related to goal attainment (Corrigan et

al., 2009). Therefore, the current study was designed to assess if higher academic achievement could protect individuals with mental illness from the negative influences of stigmatized attitudes towards mental health. More specifically, if higher academic achievement would help individuals restore the powerful feelings of dominance, cope with the self-stigma and eventually become more open to stigma reduction strategies.

Despite these findings on the pervasively detrimental impact of stigma, along with a thorough research on different types of mental illness, we know relatively little about the sources of self-perpetrated stigmatizing attitudes, let alone possible ways to alleviate those misconceptions about oneself. Recent researches took an unexpected approach in proposing that theatrical interventions would be an effective strategy to prevent and reduce mental illness stigma. For example, a one-woman stage play specifically targeting bipolar disorder stigma designed by a playwright and actress living with bipolar disorder showed enduring and positive impact on stigmatizing attitudes (Michalak et al., 2014). A more practical way to reach a larger audience and combat stigma is video presentation. A documentary about a homeless person with mental disorder interacting with the reporter of the video has shown to have a significant effect on reducing stigmatizing attitudes (Tolomiczenko, Goering, & Durbin, 2001). Because the current study recruits participants abroad in three different countries, video intervention was undoubtedly a more practical intervention.

In conclusion, it is important to rethink the contribution of social factors to better understand the root of stigma, and to help find potential solutions. This study builds off prior work and utilizes video intervention to investigate if people with higher academic achievement, measured by grade average point (GPA), would be empowered by higher self-esteem and show more positive changes in self-stigma after the intervention. We hypothesized that: (1) the higher

the perceived self-stigma, the more severe the depressive symptoms displayed by patients, and (2) academic achievement moderates the relationship between self-stigma before and after the stigma reduction methods in a way that people with higher GPA would report a lower level of self-stigma, compared to people with lower GPA.

Methods

Study Design and Participants

The study adopted a between groups experimental research design in order to assess the impact of a video intervention on perceived stigma. Participants were all college students who were aged 18 years or older and were able to read and write in English. They were recruited in two large Asian regions: Taiwan and India, and in the United States. Ethical approval for the study was provided by the Institutional Review Board at the University of North Carolina at Chapel Hill, and written informed consent was obtained from all the participants before the survey. The participants recruited in Taiwan entered a raffle after completing the survey to win a $15 convenience store gift card; participants in India and US had raffles for $15 Amazon gift cards (Amazon is not available in Taiwan currently). All participants were debriefed at the end of the study with their scores and corresponding interpretation indicting if they need to be alarmed or need immediate assistance. A written script including web links to informational resources and regional mental health support groups, such as the Depression and Bipolar Support Alliance (DBSA), Anxiety and Depression Association of America (ADAA), and BetterHelp was also included in the end-of-survey message. Unfortunately, due to a low number of participants, such help groups are rare in Asian countries, so BetterHelp, an online portal that provides direct-to-consumer access to behavioral health services, serves as our only resort for oversea participants.

Recruitment and Study Procedure

The study participants were recruited with multiple methods including contacting previous study subjects of the Principal Investigator's (PI) connections in Taiwan and India and social media communications (e.g. email newsletter announcements for subscribers, posting on the school's Facebook and Twitter accounts). Advertisements about the study were designed by PI and its connection and distributed across different college campuses. People who showed interest to participate in the study were asked to send an email to the PI. PI will then email them the link to the electronic survey that in the first part includes a consent form, a demographic survey, and a question about their current GPA. Participants then proceeded to complete the first two subscales of the stigma measure and the first three questions of the depressive symptom survey on their own devices. They were then randomly assigned to two groups: (1) filmed video on personal narratives about experience of stigma (n = 22), or (2) an informative video with some facts about mood disorder (n = 16). All participants were then asked to complete the rest of the stigma and depression measures.

Interventions

The experimental group received a link with a video about an individual diagnosed with bipolar disorder narrating some general stereotypes and stigma mentally ill people experience daily. This video footage was obtained on YouTube.com. In the experimental group, the participants watched a video named "Mental Illness Stereotypes" on https://www.youtube.com/watch?v=QB0aNw5u56g&t=15s, and for control group, the video is on https://www.youtube.com/watch?v=ZwMlHkWKDwM&t=55s.

Measures

The Self-Stigma of Mental Illness Scale (SSMIS; Corrigan et al., 2012). This 40-item scale assesses a person's experience of stigma with four subscales indicating a four-stage process: *awareness* of the stereotypes about mental illnesses, *agreement* with these stereotypes, *application* of the stereotypes to themselves, and resulting *harm* -- such as lower self-esteem. Cronbach alphas for awareness, agreement, application and harm are 0.91, 0.72, 0.81 and 0.88, respectively. Prior work found significant correlations ($p < .001$) and moderate effect sizes between stereotype agreement and the self–application and self–esteem decrement (Corrigan et al., 2012).

The Patient Health Question-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001). This 9-item survey screens for the presence and severity of depression. The questions are based on diagnostic criteria of depression from Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (American Psychiatric Association, 2001) and ask about the patient's experience in the last 2 weeks. Questions are about the level of interest in doing things, feeling down or depressed, difficulty with sleeping, energy levels, eating habits, self-perception, ability to concentrate, speed of functioning and thoughts of suicide (Kroenke & Spitzer, 2002). Validity and reliability tests were conducted in 2001, finding a Cronbach's alpha of 0.89 among 3000 primary care patients and 0.86 among 3000 obstetrical-gynecological clinic patients. And a test-retest reliability was satisfactory, with a correlation of 0.84 between administrations that were two months apart (Kroenke et al., 2001).

Data Analysis and Power

Quantitative data were analyzed using SPSS version 24. Because we did not know the direction of the main effect, we chose a two-tailed test, with alpha = .05 and power of .80. We anticipated a small to medium effect size for participants in each group because a short-term

exposure to undesirable situation is not likely to have a large size of effect on self-stigma. Therefore, after changing the effect size to f=0.15, we still need a total N=267 to have at least 80% power to test the moderating effect of GPA on the effect of the debiasing video.

Results

Preliminary Analyses and Descriptive Statistics

The study recruited participants over the Internet in three different countries: Taiwan, India and the United States. We used snowballing or chain-referral sampling techniques and received a total of 65 interest emails. Of the 65 contacted individuals, 55 (85%) were enrolled in the study. Seventeen of those responses were excluded in data analysis because of missing items and too short response time (<10 minutes), based on the fact that the videos are both 10 minutes long. Overall, the majority of the total sample were female (n=37, 97%), ranging in age from 18 to 34 (M = 20, SD = 1.58). The majority described themselves as Asian/Pacific Islander (n = 23 or 61%) with the second most commonly endorsed racial identity being white (n = 12 or 32%); There were 22 participants (58%) randomly assigned to the intervention group and sixteen to the control group. All the universities the participants study at use the 4.0 scale for grade point average. The average reported GPA was 3.33, ranging from 2.40 to 4.00. Regressions testing the potential moderating effect centered GPA around the grand mean. In other words, we redefined the 0 point for the predictor GPA to be 3.33 because 0 was an observed value for GPA (Tabachnick & Fidell, 2007).

Hypothesis 1: The Higher the Perceived Self-Stigma, the More Severe the Depression

We did not find a significant correlation between PHQ-9 and SSMIS scores, which was predictable, considering the correlation obtained from the data was negative (see Table 4). Thus,

our first hypothesis that people who are more depressed should score higher on the stigma measure was not supported.

Before we could proceed forward with any *t*-test, we needed to confirm the dependent variable was approximately normally distributed. In this case, the SSMIS and PHQ-9 scores recorded should be normally distributed and not contain any outliers. Therefore, we checked the skewness and kurtosis of the data to ensure that the assumption of normality had not been violated (see Table 3). The values for asymmetry and kurtosis between -2 and +2 are considered acceptable in order to prove normal univariate distribution (George & Mallery, 2003). Therefore, because the skewness and kurtosis of the scores of the measures used in this study were both within the acceptable range, we could proceed forward without having to transform data to normal distribution.

We first split the file based on the conditions assigned and conducted a paired-samples *t*-test for both the SSMIS and PHQ-9 scores (see Table 1 and 2). We observed an increasing trend of both the self-stigma and depression stigma scores in both conditions. However, there were different numbers of items in the pre- and posttest for the PHQ-9. After calculating the percentage of the maximum value for the means (*Before* = 45%, *After* = 32% in condition 1; *Before* = 47%, *After* = 31% in condition 2), we concluded that the depression score of the participants decreased after the intervention in both groups, which was what the hypothesis predicted. The insignificance in the means difference can be explained by sample size. Given the fact that our sample size is so small (n=22) and the power analysis indicated that we needed for 130, we calculated the Cohen's d to measure the effect size; d=0.45, which represents a medium effect size.

Inspection of descriptive statistics of the data revealed that PHQ-9 and SSMIS scores were normally distributed for both groups and that there was homogeneity of variance as assessed by Levene's Test for Equality of Variances. Therefore, an independent t-test was run on the data with a 95% confidence interval (CI) for the mean difference. It was found that after the intervention, the SSMIS scores in the intervention group (M = 129.45, SD = 45.43) were not significantly lower than the control group (M = 108.56, SD = 52.04); $t(36) = 1.32$, $p = 0.196$).

Hypothesis 2: Academic Achievement Moderates the Relationship Between Self-Stigma Scores Before and After the Stigma Reduction Methods

Academic achievement, which was measured by GPA, was examined as a moderator for the interventional effect of watching the videos about mental disorders on stigma scores. We ran a linear regression analyses with three-way interactions using posttest stigma score as dependent variable, and pretest scores, centered GPA, conditions and the interaction terms as predictors. However, none of the interaction terms played a significant role in influencing the posttest scores (see Table 6). Thus, our second hypothesis was not supported by the results.

We conducted an additional linear regression analysis to test the two-way interaction between GPA and pre-intervention score for the entire sample. As shown in Table 7, although the interaction term still did not make an incremental contribution to the posttest score, the pretest scores did explain a significant increase in variance in post-test stigma score ($R^2 = 0.17$, $F(3,34) = 3.54$, $p < 0.05$). Surprisingly, when we removed the interaction term and reran the regression with only the GPA and pretest score as predictors (see Table 8), we managed to find significant contribution of both factors ($R^2 = 0.20$, $F(2,35) = 5.47$, $p < 0.05$). therefore, we concluded that the main effect of GPA was significant but the interaction term between GPA and pretest was not.

Another important factor evaluated in this study was culture, or more specifically, the race of the participants. We ran another independent-samples t-test for SSMIS scores using the grouping variable of being Asian or not. Although we did not find a significant difference between the group that identified as Asian and the others, we did find a relatively high effect size ($d = 0.54$) that suggests a noteworthy difference in means being two groups in a small sample.

Discussion

We did not find a significant correlation between the pretest and posttest self-stigma scale, which may have been because the first two subscales focus on the public ideas of the mentally ill population, whereas the posttest focuses on the application and harm of internalizing stigmatized attitude from the outside world, hence represents self-stigma. However, we did find a significant positive correlation between the pretest and posttest scores of the PHQ-9, which means that the people who were depressed at the beginning of the study were more likely to remain depressed at the end of the study.

Due to limited time for recruitment and also potential risks with enrolling people with a history or current status of mental disorders, we decided to recruit subjects from the general public and asked them to imagine what they would feel like if they were to have mental illnesses. This recruitment decision caused two problems. First of all, the sample size was too small to detect a small to medium effect size. Secondly, sample representativeness potentially led the results to show an increasing trend in the self-stigma scores after the video interventions in all subjects. It cannot be assumed that the participants in the current study represent the average person with mental illness diagnosis. The video may have served as a reminder and confirmation of their original beliefs and attitudes. When imagining themselves in the situation of the mentally ill population, they were reminded of the importance of being empathetic and compassionate so

they overestimated the shame and stigma those vulnerable people go through. The trend we see based on the data from three previous studies comprised subjects with serious mental illness (Corrigan, Rafacz, & Rüsch, 2011; Corrigan, Watson, & Barr, 2006; Rüsch et al., 2009) is going the opposite of the pattern, that is, repeated measures ANOVAs showed subscale means progressively diminished from awareness to harm. Thus, future research could focus on recruiting people with mental illness history to obtain more representative self-stigma scores.

It is also interesting that we found a significant effect of academic achievement and pretest scores as predictors for posttest scores in the regression analysis, and neither of them served as a moderator. One possible explanation is that most of the subjects in this study were non-native English speakers. Although they are currently receiving a higher education in their own countries, their classes are taught mostly in their native languages. They are not constantly being exposed to an English-speaking environment. Therefore, we have no knowledge of their English comprehension ability. That being said, people with higher GPA might also have a better comprehension ability, which led them to better understand the materials they watched. Going back to our previous assumption that people show sympathy and understanding after watching the video, it is possible that people with higher English comprehension ability better absorbed the emotions and information expressed in the videos, hence receiving a higher score on posttest.

In addition, although stigma is a social phenomenon that has universal features and consequences, there is evidence that different illnesses can be associated with different stereotypes. The current study focused on assessing the impact of an informative video about mood disorder and an interventional video about some general stereotypes and labels mentally ill population experience. The fact that we did not find a significant impact of the intervention video

leads to the suggestion that future stigma reduction strategies will be more successful if they target a specific condition rather than mental illness broadly.

Another limitation of the current study was related to our selected assessment scales. A growing number of scales designed to measure stigma have emerged in meta-analysis of this prevalent social process (Corrigan et al., 2012), their ability to detect change has not been fully tested. The scales, the SSMIS and PHQ-9, used in the current study have been proved to be reliable and valid (Corrigan et al., 2006; Kroenke & Spitzer, 2002). To make sure these scales are also valid and reliable in a different population, we also calculated the Cronbach's alpha to prove their validity and reliability. It was 0.936 and 0.943, respectively. However, they are explicit measures of attitudes and beliefs, which are prone to social desirability bias. That being said, incorporating implicit measure of stigma could be a way to avoid that bias in future studies. Moreover, participants in previous studies using the self-stigma measure reported some individual items to be especially offensive: e.g., people with mental illness are disgusting, or dirty and unkempt. One consequence was some participants may have dropped out of the study because of the harsh tone. Hence, future studies could also adopt a shorter version of the SSMIS that removes particularly offensive items. Fortunately, a 20-item short form (SSMIS-SF) has been developed with help from the consumers of mental health services and shown to be reliable and valid.

Lastly, GPA is not an ideal measurement of academic achievement. Researchers have always been hesitant to define what constitutes academic success because it encompasses numerous student outcomes. The tendency to limit students' achievements to the attainment of outcomes specific to educational experiences is concerning. The proliferation of researches concerned with identifying the right constructs that include students' learning and development

is also evidence for widening the definition of academic achievement. Due to limited time and a multisite recruitment, the current study adopted the most commonly used measure of academic success, GPA. Therefore, we encourage future researchers to expand their definition of academic success beyond that of academic achievement. We suggest an approach that evaluates specific growth of cognitive ability or acquisition of skills or learning outcomes. Similar studies also encourage postsecondary institutional assessments that include post-college measures beyond the common measurements of persistence and satisfaction (York, Gibson, & Rankin, 2015). These more comprehensive measures will provide a more robust assessment of students' academic performances.

Several systematic reviews using either meta-analytic or narrative synthesis provide a valuable summary of both the different types of stigma reduction strategies and an evaluation of those interventions (Gronholm, Henderson, Deb, & Thornicroft, 2017). Although national anti-stigma programs using mass media are associated with reductions in overall levels of discrimination (Thornicroft, Wyllie, Thornicroft, & Mehta, 2014), it is hard to show a causal association in such a large scope. If we want to better identify effective and replicable interventions, we need to work with populations that have potential for changing the current situation and future. Healthcare professionals, law enforcement officers, students, and young people should be our key target groups because of their risk for mental health challenges, their potential openness to change, and the opportunity for them to interact with others in settings that could reduce the effects of stigma. Results from the meta-analysis by Corrigan and colleagues (2012) showed that although direct contact was more effective for adults, this was not the case for adolescents, who tended to benefit more from educational approaches. Moreover, a systematic review of the overall effect of different interventions delivered to student groups

(Yamaguchi et al., 2013) indicated that live or video-based contact with people with mental health issues were the most effective interventions in improving attitudes and reducing desire for social distance. The current study involving college students from three different countries adopted video-based intervention but failed to show an impact on participants' attitudes or stereotype endorsement related to people with mental illness. Potential reasons for statistically non-significant results were discussed above, and we would like to propose some recommendations for future evaluation studies regarding a specific intervention strategy: (1) randomize designs for interventions tailored to specific groups; (2) include questions or behavioral analysis regarding people's reaction towards the intervention content to understand the direction of the effect (e.g., What do you think of the video? Do you feel more irritated or more sympathized after the video?); (3) increase sample size with better sampling procedures to increase representativeness and (4) add follow-up data collection some period of time after the immediate end of the intervention to test for the long-term impact.

References

Abramson, L. Y., Alloy, L. B., & Metalsky, G. I. (1990). Hopelessness depression: an empirical search for a theory-based subtype. *Contemporary Psychological Approaches to Depression, 96,* 358-372.

Booth, M. Z., & Gerard, J. M. (2011). Self-esteem and academic achievement: a comparative study of adolescent students in England and the United States. *Compare: A Journal of Comparative and International Education, 41*, 629-648.

Chan, Y. M. (2000). Self-esteem: A cross-cultural comparison of British-Chinese, White British and Hong Kong Chinese children. *Educational Psychology*, *20*, 59–74. https://doi.org/10.1080/014434100110380

Corrigan, P. W., Larson, J. E., & Rüsch, N. (2009). Self-stigma and the "why try" effect: impact on life goals and evidence-based practices. *World Psychiatry, 8*, 75-81.

Corrigan, P. W., Morris, S. B., Michaels, P. J., Rafacz, J. D., & Rüsch, N. (2012). Challenging the Public Stigma of Mental Illness: A Meta-Analysis of Outcome Studies. *Psychiatric Services*, *63*, 963–973. https://doi.org/10.1176/appi.ps.201100529

Corrigan, P. W., Rafacz, J., & Rüsch, N. (2011). Examining a progressive model of self-stigma and its impact on people with serious mental illness. *Psychiatry Research*, *189*, 339–343. https://doi.org/10.1016/j.psychres.2011.05.024

Corrigan, P. W., & Watson, A. C. (2002). Understanding the impact of stigma on people with mental illness. *World Psychiatry*, *1*, 16–20.

Corrigan, P. W., Watson, A. C., & Barr, L. (2006). The Self–Stigma of Mental Illness: Implications for Self–Esteem and Self–Efficacy. *Journal of Social and Clinical Psychology*, *25*, 875–884. https://doi.org/10.1521/jscp.2006.25.8.875

Drabick, D. A. G., & Kendall, P. C. (2010). Developmental Psychopathology and the Diagnosis of Mental Health Problems among Youth. *Clinical Psychology*, *17*, 272–280.

Fung, K. M., Tsang, H. W., & Corrigan, P. W. (2008). Self-stigma of people with schizophrenia as predictor of their adherence to psychosocial treatment. *Psychiatric Rehabilitation Journal,32*(2), 95-104.

George, D., & Mallery, P. (2003). SPSS for Windows Step by Step: Answers to Selected Exercises. *A Simple Guide and Reference*, 63. https://doi.org/9780335262588

Gronholm, P. C., Henderson, C., Deb, T., & Thornicroft, G. (2017). Interventions to reduce discrimination and stigma: the state of the art. *Social Psychiatry and Psychiatric Epidemiology*, *52*, 249–258. https://doi.org/10.1007/s00127-017-1341-9

Kroenke, K., & Spitzer, R. L. (2002). The PHQ-9: A New Depression Diagnostic and Severity Measure. *Psychiatric Annals*, *32*, 509–515. https://doi.org/10.3928/0048-5713-20020901-06

Mehrabian, A. Pleasure-arousal-dominance: A general framework for describing and measuring individual differences in Temperament. Current Psychology (1996) 14: 261.

Michalak, E. E., Livingston, J. D., Maxwell, V., Hole, R., Hawke, L. D., & Parikh, S. V. (2014). Using theatre to address mental illness stigma: a knowledge translation study in bipolar disorder. *International Journal of Bipolar Disorders*, *2*, 1-12.

Parcesepe, A. M., & Cabassa, L. J. (2013). Public Stigma of Mental Illness in the United States: A Systematic Literature Review. *Administration and Policy in Mental Health*, *40*, 384-99

Plutchik, R. (1994). *The psychology and biology of emotion.* New York: Harper Collins.

Rüsch, N., Corrigan, P. W., Wassel, A., Michaels, P., Olschewski, M., Wilkniss, S., & Batia, K.

(2009). Ingroup perception and responses to stigma among persons with mental illness. *Acta Psychiatrica Scandinavica*, *120*, 320–328. https://doi.org/10.1111/j.1600-0447.2009.01403.x

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics (5th ed.).* Boston, MA: Allyn & Bacon.

Thornicroft, C., Wyllie, A., Thornicroft, G., & Mehta, N. (2014). Impact of the "like Minds, Like Mine" anti-stigma and discrimination campaign in New Zealand on anticipated and experienced discrimination. *Australian and New Zealand Journal of Psychiatry*, *48*, 360–370. https://doi.org/10.1177/0004867413512687

Tolomiczenko, G. S., Goering, P. N., & Durbin, J. F. (2001). Educating the public about mental illness and homelessness: A cautionary note. *The Canadian Journal of Psychiatry*, *46,* 253-257.

Wahl, O. F. (1999). Mental Health Consumers Experience of Stigma. *Schizophrenia Bulletin, 25*, 467-478.

Yamaguchi, S., Wu, S. I., Biswas, M., Yate, M., Aoki, Y., Barley, E. A., & Thornicroft, G. (2013). Effects of short-term interventions to reduce mental health-related stigma in university or college students: A systematic review. *Journal of Nervous and Mental Disease*, *201*, 490–503. https://doi.org/10.1097/NMD.0b013e31829480df

York, T. T., Gibson, C., & Rankin, S. (2015). Defining and Measuring Academic Success. *Practical Assessment, Research & Evaluation*, *20*, 1–20. Retrieved from http://pareonline.net/getvn.asp?v=20&n=5

Table 1

Comparison of scores for participants in the intervention group

Stigma measure	Before		After		Repeated *t* test	*d*
	Mean	*SD*	Mean	*SD*		
SSMIS	57.77	24.81	71.68	35.78	t (22) = -1.57, p = 0.13	0.45
PHQ-9	4.05	3.09	5.78	5.47	t (22) = -2.75, p = 0.01	0.39

Table 2

Comparison of scores for participants in the control group

Stigma measure	Before		After		Repeated *t* test	*d*
	Mean	*SD*	Mean	*SD*		
SSMIS	47.75	27.31	60.81	35.46	t (16) = -1.45, p = 0.17	0.41
PHQ-9	4.19	2.66	5.50	4.58	t (16) = -2.15, p = 0.05	0.35

Note. SSMIS = Self-Stigma of Mental Illness Scale; PHQ-9 = Patient Health Question-9.

Table 3

Descriptive Statistics for stigma (SSMIS) and depressive symptom (PHQ9) scores

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
PHQ9	38	9.76	7.76	.90	.38	-.59	.75
SSMIS	38	120.66	48.77	.25	.38	-.80	.75
Valid *N* (listwise)	38						

Table 4

Summary correlations between stigma *(SSMIS) and depressive symptoms (PHQ9) (N*=38*).*

		SSMIS	PHQ9
SSMIS	Pearson Correlation	1	-.10
	Sig. (2-tailed)		.53
PHQ9	Pearson Correlation	-.10	1
	Sig. (2-tailed)	.53	
M		120.66	9.76
SD		48.77	7.76
Skew		0.25	0.90
Kurtosis		-0.80	-0.59

Note. Skewness and kurtosis levels were within tolerable range for distributional assumptions for *t*-test and regression analyses (Tabachnick & Fidell, 2007).

Table 5

Independent samples t-test based on video conditions

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
SSMIS	Equal variances assumed	.64	.43	1.32	36.00	.202	20.89	15.87	-11.29	53.07
	Equal variances not assumed			1.29	29.72	.213	20.89	16.22	-12.24	54.03
PHQ9	Equal variances assumed	1.24	.27	.05	36.00	.964	.13	2.58	-5.11	5.37
	Equal variances not assumed			.05	35.11	.964	.13	2.51	-4.97	5.24

Table 6

Linear Regression Analysis for Three-Way Interaction

Model summary for three-way interaction

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.55[a]	.31	.15	32.89	.31	1.90	7	30	.112

a. Predictors: (Constant), moderator4, Zscore(GPA), SSMISpre, moderator3, Condition, moderator, moderator2

Linear regression analysis of post-intervention stigma scores using pretest scores, GPA and conditions[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	40.26	20.26		1.99	.062
	SSMISpre	.34	.41	.25	.83	.413
	Zscore(GPA)	18.23	21.63	.51	.84	.414
	Condition	2.83	28.87	.04	.10	.924
	moderator	-.01	.38	-.01	-.02	.985
	moderator2	.51	.58	.60	.89	.386
	moderator3	-26.59	32.07	-.51	-.83	.413
	moderator4	.32	.56	.31	.56	.585

a. Dependent Variable: SSMISpost

Table 7

Linear Regression Analysis for Two-Way Interaction

Model summary

					Change Statistics			
Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	R^2 Change	F Change	df_1 df_2	p Change
1	.49[a]	.24	.17	32.40	.24	3.54	3 34	.02

a. Predictors: (Constant), moderator, SSMISpre, Zscore(GPA)

Linear regression analysis of post-intervention stigma scores using pretest scores, GPA and their interaction term[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		*B*	Std. Error	Beta	*t*	*p*
1	(Constant)	43.41	12.64		3.44	.001
	SSMISpre	.44	.21	.32	2.10	.043
	Zscore(GPA)	15.07	13.99	.42	1.08	.298
	moderator	.01	.22	.01	.04	.977

a. Dependent Variable: SSMISpost

Table 8

Linear Regression Analysis for Two Variables

Model summary for linear regression analysis without moderator

					Change Statistics				
Model	R	*R* Square	Adjusted *R* Square	*SE* Estimate	*R* Square Change	*F* Change	*df1*	*df2*	*p* Change
1	.49[a]	.24	.19	31.93	.24	5.47	2	35	.009

a. Predictors: (Constant), Zscore(GPA), SSMISpre

Linear regression analysis of post-intervention stigma scores using pretest scores, GPA[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		*B*	*SE*	Beta	*t*	*p*
1	(Constant)	43.32	12.20		3.55	.001
	SSMISpre	.44	.21	.32	2.15	.038
	Zscore(GPA)	15.55	5.36	.44	2.90	.006

a. Dependent Variable: SSMISpost

Table 9

Independent Samples Test Based on Race

		Levene's Test for Equality of Variances		*t*-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	*p*	*t*	*df*	*p*	Mean Difference	Std. Error Difference	Lower	Upper
SSMIS	Equal variances assumed	1.74	.196	1.44	36	.158	23.01	15.95	-9.35	55.36
	Equal variances not assumed			1.35	23	.190	23.01	17.04	-12.19	58.21

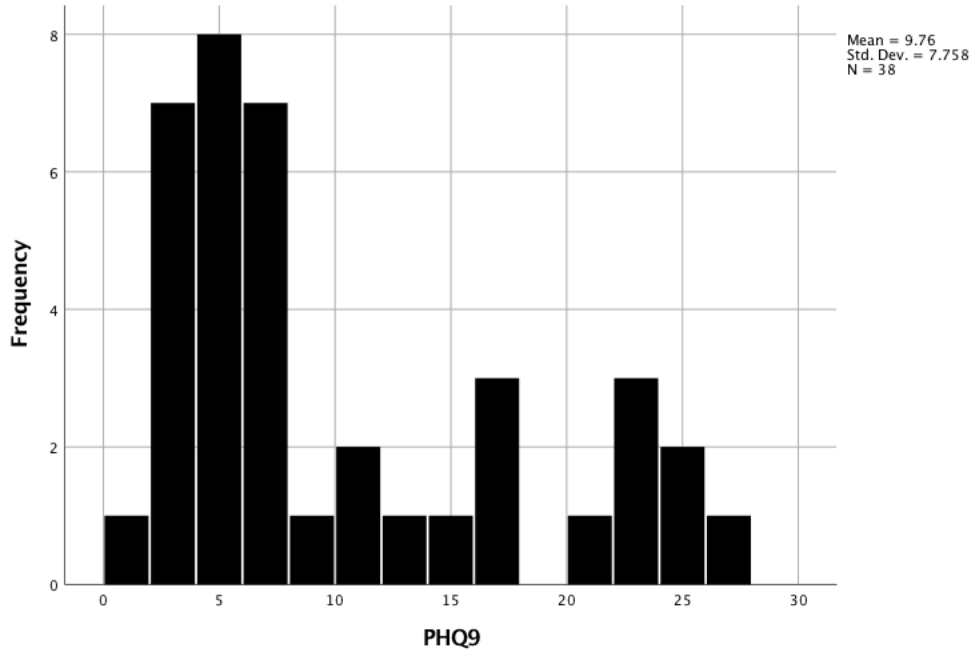

Figure 1. Score distribution of the Patient Health Question-9 (PHQ-9)

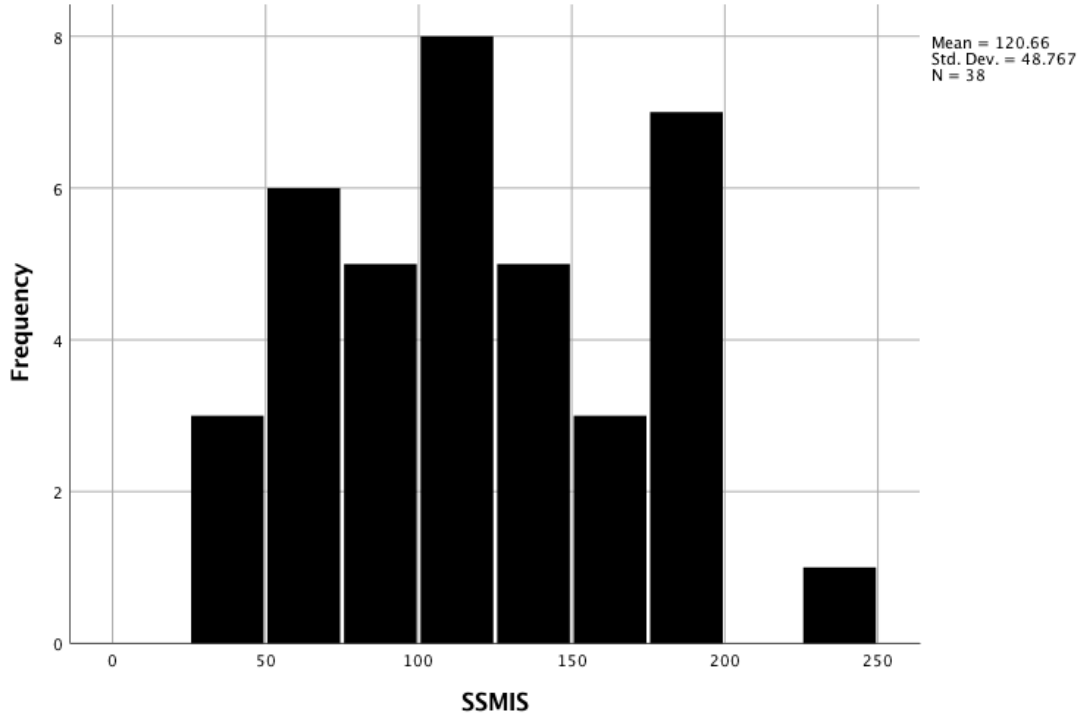

Figure 2. Score distribution of the Self-Stigma of Mental Illness Scale (SSMIS)